

CLAIMS

What is claimed is:

1. A circuit board comprising:
  - 5 a first signal layer having a signal conductor and a contact pad in electrical communication with the signal conductor;
  - a second signal layer substantially parallel to the first signal layer, the second signal layer having a conductive plane defining an opening, the opening substantially aligned with the contact pad, and the opening configured to minimize a signal reflection
  - 10 of a signal transmitted through the signal conductor and across the contact pad; and
  - a nonconductive layer disposed between the first signal layer and the second signal layer.
2. The circuit board of claim 1 wherein the contact pad comprises a pad center axis and  
15 wherein the opening, defined by the conductive plane, comprises an opening center axis, the pad center axis substantially perpendicular to the first signal layer, the opening center axis substantially perpendicular to the second signal layer, and the pad center axis and the opening center axis being collinear.
- 20 3. The circuit board of claim 2 wherein the signal conductor comprises a centerline and wherein the pad center axis and the opening center axis substantially intersect the centerline of the signal conductor.
4. The circuit board of claim 2 wherein the signal conductor comprises a centerline and  
25 wherein the pad center axis and the opening center axis define an offset distance relative to the centerline of the signal conductor.
5. The circuit board of claim 2 wherein the opening defined by the conductive plane

comprises an opening diameter and wherein the contact pad comprises a pad diameter, the opening diameter being smaller than the contact pad diameter.

- 5 6. The circuit board of claim 1 wherein the contact pad comprises a pad center axis and wherein the opening, defined by the conductive plane, comprises an opening center axis, the pad center axis substantially perpendicular to the first signal layer, the opening center axis substantially perpendicular to the second signal layer, and the pad center axis and the opening center axis oriented substantially parallel and defining an offset distance between the pad center axis and the opening center axis.
- 10 7. The circuit board of claim 6 wherein the signal conductor comprises a centerline and wherein the pad center axis of the contact pad substantially intersects the centerline of the signal conductor.
- 15 8. The circuit board of claim 6 wherein the signal conductor comprises a centerline and wherein the opening center axis of the opening defined by the conductive plane substantially intersects the centerline of the signal conductor.
- 20 9. The circuit board of claim 6 wherein the signal conductor comprises a centerline, the pad center axis of the contact pad defines a first centerline offset relative to the centerline of the signal conductor, and the opening center axis of the opening defined by the conductive plane defines a second centerline offset relative to the centerline of the signal conductor.
- 25 10. The circuit board of claim 6 wherein the opening defined by the conductive plane comprises an opening diameter and wherein the contact pad comprises a pad diameter, the opening diameter being at least equal to the contact pad diameter.

11. The circuit board of claim 1 wherein the contact pad comprises a testing pad that allows attachment of a circuit board testing device to the circuit board.

12. The circuit board of claim 1 wherein the contact pad comprises a circuit board component connection pad that allows attachment of a circuit board component to the circuit board.

13. An electronic system comprising:

a power supply having a voltage terminal and a ground terminal;

10 an interconnect in electrical communication with the voltage terminal and the ground terminal of the power supply; and

a circuit board having:

a first signal layer having a signal conductor and a contact pad in electrical communication with the signal conductor,

15 a second signal layer substantially parallel to the first signal layer, the second signal layer having a conductive plane defining an opening, the conductive plane in electrical communication with one of the voltage terminal and the ground terminal of the power supply through the interconnect, the opening substantially aligned with the contact pad, and the opening configured to minimize a signal reflection of a signal transmitted through the signal conductor and across the contact pad, and

20 a nonconductive layer disposed between the first signal layer and the second signal layer.

25 14. The electronic system of claim 13 wherein the contact pad comprises a pad center axis and wherein the opening, defined by the conductive plane, comprises an opening center axis, the pad center axis substantially perpendicular to the first signal layer, the opening center axis substantially perpendicular to the second signal layer, and the pad

center axis and the opening center axis being collinear.

15. The electronic system of claim 14 wherein the signal conductor comprises a centerline and wherein the pad center axis and the opening center axis substantially  
5 intersect the centerline of the signal conductor.

16. The electronic system of claim 14 wherein the signal conductor comprises a centerline and wherein the pad center axis and the opening center axis define an offset distance relative to the centerline of the signal conductor.

10

17. The electronic system of claim 14 wherein the opening defined by the conductive plane comprises an opening diameter and wherein the contact pad comprises a pad diameter, the opening diameter being smaller than the contact pad diameter.

15 18. The electronic system of claim 13 wherein the contact pad comprises a pad center axis and wherein the opening, defined by the conductive plane, comprises an opening center axis, the pad center axis substantially perpendicular to the first signal layer, the opening center axis substantially perpendicular to the second signal layer, and the pad center axis and the opening center axis oriented substantially parallel and defining an  
20 offset distance between the pad center axis and the opening center axis.

19. The electronic system of claim 18 wherein the signal conductor comprises a centerline and wherein the pad center axis of the contact pad substantially intersects the centerline of the signal conductor.

25

20. The electronic system of claim 18 wherein the signal conductor comprises a centerline and wherein the opening center axis of the opening defined by the conductive plane substantially intersects the centerline of the signal conductor.

21. The electronic system of claim 18 wherein the signal conductor comprises a centerline, pad center axis of the contact pad defines a first centerline offset relative to the centerline of the signal conductor, and the opening center axis of the opening defined by the conductive plane defines a second centerline offset relative to the centerline of the signal conductor.
22. The electronic system of claim 18 wherein the opening defined by the conductive plane comprises an opening diameter and wherein the contact pad comprises a pad diameter, the opening diameter being at least equal to the contact pad diameter.
23. The electronic system of claim 13 wherein the contact pad comprises a testing pad that allows attachment of a circuit board testing device to the circuit board.
24. The electronic system of claim 13 wherein the contact pad comprises a circuit board component connection pad that allows attachment of a circuit board component to the circuit board.
25. A method for assembling a circuit board comprising:
- forming a first signal layer having a signal conductor and a contact pad in electrical communication with the signal conductor;
- forming a second signal layer substantially parallel to the first signal layer, the second signal layer having a conductive plane defining an opening substantially aligned with the contact pad; and
- disposing a nonconductive layer between the first signal layer and the second signal layer.
26. The method of claim 25 wherein:

the step of forming a first signal layer further comprises forming a contact pad having a pad center axis, the pad center axis substantially perpendicular to the first signal layer; and

- 5 the step of forming a second signal layer further comprises forming the opening having an opening center axis, the opening center axis substantially perpendicular to the second signal layer and the pad center axis and the opening center axis being collinear.

27. The method of claim 25 wherein:

- 10 the step of forming a first signal layer further comprises forming a contact pad having a pad center axis, the pad center axis substantially perpendicular to the first signal layer; and

- the step of forming a second signal layer further comprises forming the opening having an opening center axis, the opening center axis substantially perpendicular to the second signal layer and the pad center axis and the opening center axis oriented  
15 substantially parallel and defining an offset distance between the pad center axis and the opening center axis.

28. A circuit board comprising:

- 20 a first signal layer having a signal conductor means and a contact pad means in electrical communication with the signal conductor;

- a second signal layer substantially parallel to the first signal layer, the second signal layer having a conductive plane defining an opening means for substantially normalizing an impedance of the signal conductor means and an impedance of the contact pad means, the opening means substantially aligned with the contact pad means,  
25 and the opening means minimizing a signal reflection of a signal transmitted through the signal conductor means and across the contact pad means; and

a nonconductive layer disposed between the first signal layer and the second signal layer.